FORESTS AND RAINFALL.

PROFESSOR J. SCHUBERT, director of the meteorological division of the Prussian forestry experiment station work, has made a study of the relation of forests and precipitation in Silesia, taking as a basis the rainfall map published by Hellmann in 1899. The conclusion reached—the author himself says that his estimates are to some extent uncertain—is that forests seem to produce an increase in precipitation. If one half of the observed difference is set down as being due to the increased protection of the gauges set up in or near the forests, the actual effect of the trees themselves would roughly correspond to an increase in altitude of 40 meters (*Met. Zeitschr.*, December, 1905).

NOTES.

A NEW aeronautical observatory is to be established at Friedrichshafen, on the shore of the Lake of Constance, for carrying out meteorological observations in the free air by means of kites. The money for original equipment, and for annual expenses, is to be contributed by Germany, Wurtemberg, Bavaria, the Duchy of Baden and Alsace-Lorraine. Observations are to begin January 1, 1907. Boats of special construction are to be built for flying the kites (*Ciel et Terre*, January 16, 1906).

THE French Glacier Commission has been carrying out a series of measurements of snowfall at different altitudes on Mont Blanc. In general it appears that the snowfall increases with altitude between 1,000 and 3,200 meters, but the individual gauges do not give satisfactory results (*Met. Zeitschr.*, December, 1905).

R. DEC. WARD.

CARBON SUBOXIDE.

THE interesting announcement of the discovery of a new oxide of carbon has just been made by Messrs. O. Diels and B. Wolf,[1] working in E. Fischer's laboratory. When the vapor of diethyl malonate is passed over phosphorus pentoxide, heated at 300°, it suffers the loss of two molecules of alcohol, which, of course, is immediately converted into ethylene and water, and there results an oxide of carbon, C_3O_2; this is one of the two possible anhydrides of malonic acid, the other being

$$CH_2<\begin{matrix}CO\\CO\end{matrix}>O.$$

The reaction which takes place is represented by the following equation:

$$CH_2(COOC_2H_5)_2 \rightarrow 2C_2H_4 + 2H_2O + OC:C:CO.$$

The new compound is a colorless, highly refractive, very volatile liquid, boiling at 7°; it has an intense odor of acroleïn and mustard oil, and rapidly attacks the mucous membrane of the eyes, nose and respiratory organs.

Chemically, it is extremely reactive; with water malonic acid is quickly regenerated; dry hydrogen chloride gives malonyl chloride, $CH_2(COCl)_2$; aniline and ammonia yield malonanilide, $CH_2(CONHC_6H_5)$ and malonamide, $CH_2(CONH_2)_2$, respectively.

Although carbon suboxide can be volatilized under reduced pressure, so as to admit of the determination of its vapor density, yet it slowly undergoes spontaneous decomposition at the ordinary temperature. The product is a dark red solid, which dissolves in water, giving an intense eosin red color. At 37° the decomposition of the suboxide is much more rapid and at 100° it is instantaneous. Under these conditions there is formed a deep blackish-red, very hard substance. The two solids appear to be the oxides of carbon, C_4O_3 and C_8O_3, which were described about thirty years ago by Brodie and by Berthelot.

Even from the brief description of carbon suboxide given above it will be seen that its properties and mode of formation are in admirable accord with the formula OC:C:CO, and that it possesses three series of relationships, according to whether it is regarded as being: (1) an oxide of carbon, (2) an anhydride of malonic acid, (3) a carbon carbonyl, similar to those of nickel and iron, $Ni(CO)_4$ and $Fe(CO)_5$, which excited so much interest at the time of their discovery some years ago.

J. BISHOP TINGLE.

[1] *Ber. d. Chem. Ges.*, **39**, 689, 1903.